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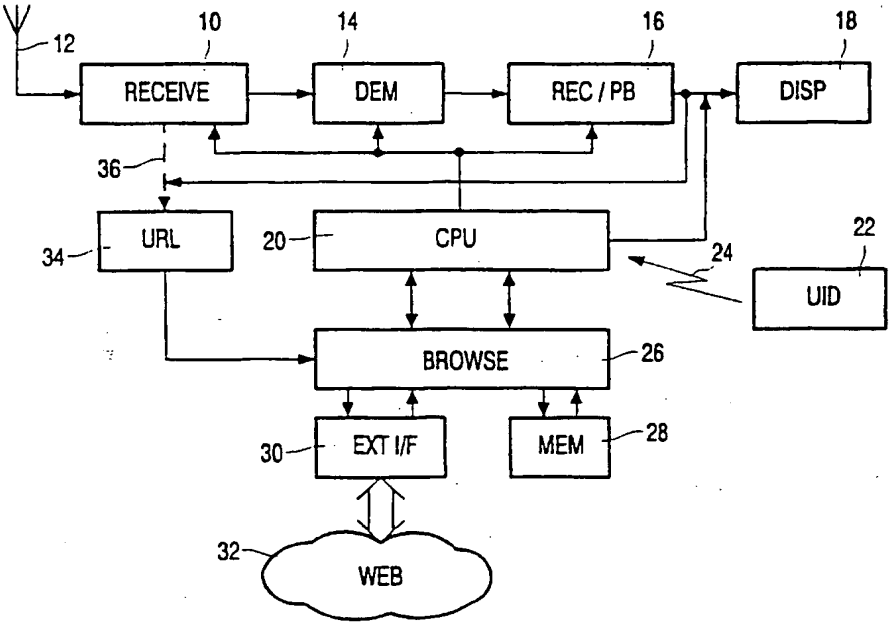
For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: VIDEO RECORDING AND PLAYBACK



(57) Abstract: A video recording and playback apparatus comprises a broadcast receiver (10) arranged to receive broadcast video signals, a display (18) and a recorder and playback stage (16). The apparatus supports at least one further functionality, such as an Internet browser (26) and is arranged, on selection by or for the user of this functionality during playback of received video images by said display (18), to automatically pause the playback whilst starting or continuing to record the received video images.

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DESCRIPTION

VIDEO RECORDING AND PLAYBACK

The present invention relates to systems and devices for recording video broadcast signals in real time and playing back the same and in particular, although not exclusively, the invention relates to such systems and devices wherein recording and playback may occur simultaneously but independently.

The facility to record and playback simultaneously but independently is becoming more widely available through digital video recording systems based around re-writable optical or magnetic discs. Such systems offer the ability to so-called timeshift a television broadcast - that is to say pausing or even reversing a broadcast before its conclusion to allow real time and slow motion action replays without either missing a subsequent part of the broadcast or having to wait until its conclusion and then reverting to the point of interest.

Another functionality that is becoming increasingly common in home audio and video (AV) equipment is Internet connectivity, with more and more television producers including embedded content in their programs in the form of URL's (Uniform Resource Locators) for web sites carrying ancillary data to the broadcast. One drawback of such devices is the need for the user typically to either note web site details during a broadcast for searching after the broadcast is completed (and once the context in which the web sites came up is no longer present) or to stop watching the broadcast when the web site details are obtained, in order to search whilst the context is still fresh.

One approach to this problem is provided by the Philips WebTV™ system which detects these URL's (referring to them as Crossover Links) and then, to avoid missing the broadcast, makes use of Picture-In-Picture

technology to permit a user to simultaneously view a website and continue to watch a broadcast.

This provides an improvement in that the user does not actually miss any of the broadcast, but it is still not ideal in that the combination of web site and live broadcast is typically more information than a user can comfortably take in.

It is accordingly an object of the present invention to provide a facility for a home AV system whereby the user is not overwhelmed by excessive amounts of data simultaneously, nor is the user required to miss parts of broadcasts in order to accommodate the data being presented.

In accordance with the present invention, there is provided a video recording and playback apparatus comprising a broadcast receiver arranged to receive broadcast video signals;

a display device coupled with said receiver and arranged to display the received video images;

a recorder and playback stage arranged to selectively record video signals received by said receiver and replay the same to said display device;

user operable input means by operation of which a user is enabled to control the functions of the display device and recorder and playback stage;

the apparatus further comprising function means supporting at least one further functionality and being arranged, on selection of said functionality during playback of received video images by said display device, to pause said playback whilst starting or continuing to record said received video images.

By triggering the start of recording (if not already underway) as well as the pausing of playback when the users attention is diverted to the further functionality, the user is provided with improved means for handling data at a rate that is comfortable and without resorting to Picture-In-Picture or other techniques to cram more data onto a screen simultaneously.

Suitably, although not necessarily, the function means supporting at least one further functionality comprises a web browser with means for connection of the same to access data via the Internet and coupled to display data on the display device. Such a web browser is preferably further operable to detect web links (e.g. URL's) accompanying a received broadcast video signal and to provide an indication of such detection to a user, for example by generation of an icon overlaying the display of received broadcast video on said display device and/or through an audio indication.

Alternately, or in addition, the above-mentioned function means supporting at least one further functionality may comprise a domestic audio or video product coupled to the apparatus (via a wired or wireless link) and configured to generate and send to the apparatus a signal indicative of selection of said functionality. As a further alternate, the said function means supporting at least one further functionality may comprise a telephone receiver coupled to the apparatus (as before, via a wired or wireless link) and configured to generate and send to the apparatus a signal indicative of selection of said functionality: in such circumstances, the telephone receiver may be arranged to generate said signal when a user picks up a handset of the receiver, either in order to make a call or when answering one, or when the receiver detects an incoming call such that the pause in playback alerts the viewer to the presence of the call. Similar functionality may be provided where the function means comprises an e-mail system.

Further features and advantages will become apparent from reading of the following description of preferred embodiments of the present invention, given by way of example only, and with reference to the accompanying drawings, in which:

Figure 1 is a block schematic diagram of functional components of an AV system suitable to embody the present invention;

Figure 2 is a flow chart listing operational steps in the handling of web access through the apparatus of Figure 1; and

Figure 3 schematically illustrates components of an alternative configuration of AV system to that of Figure 1.

Figure 1 shows a number of components making up a home video recording and web browsing system, starting with a receiver stage 10 coupled with an aerial 12 for the receipt of broadcast audio and video signals. Other forms of broadcast delivery such as cable or satellite will lead to the front-end of the receiver being configured accordingly.

From the receiver 10, the received AV signal content passes via a demultiplexer 14 (assuming the broadcast to be digital) through a recording and playback stage 16 to a display 18. As shown, the receiver 10, demultiplexer 14 and recording and playback stage 16 are controlled by a single control and processing stage in the form of a central CPU 20: this presupposes that the video recording and display functions are handled by a single piece of apparatus although, as will be recognised, separate units may be employed with CPU 20 representing the distributed but interconnected control logic between the devices. Where separate units are provided for display and for recording, the recording and playback stage 16 will typically have its own receiver and demultiplexer stages, in conventional manner. Also in conventional manner, the demultiplexer 14 may be replaced by an encoder stage (e.g. an MPEG encoder) for reception of analogue video signals: in such an arrangement, a decoder stage (not shown) will be required between the recording and playback stage 16 and the display 18.

User control of the apparatus is represented by user input device (UID) 22 coupled to the CPU 20 via infra-red link 24. The form of the UID 22 will be at least partially dictated by the functionality supported by the system as a whole, as will be recognised, and further or alternative controls (not shown) may be provided with direct (wired) connection to CPU 20. In general, the

handling (demultiplexing or coding, recording and replay) of the audio component of a broadcast signal is conventional and, other than to note that it preferably stops and starts in synchronism with the video component, it will not be further described.

A particular functionality supported by the video recording and display device of Figure 1 is an Internet browser capability 26. Whilst shown as a separate device, coupled with local memory 28 reserved for dedicated browser functions, it will be appreciated that the browser 26 may be a software module supported as a subset of the functionalities of CPU 20, with the browser module stored in a non-volatile area of memory 28 and loaded on power-up of the apparatus, or stored remotely and downloaded to CPU 20 when required.

The browser 26 may be directed, through user operation of the UID 22, to visit specifically identified locations through an external interface connection 30 linking the device to the World Wide web 32, as will be readily understood, with the data downloaded from such sites being processed via the browser 26 and CPU 20 for display via television screen 18. The system may also be set up with the system arranged to identify and capture (in buffer 34) web links accompanying broadcast and/or replayed video (as output from the recording and playback stage 16), which links identify web sites at which ancillary data to a current broadcast may be found. As indicated by dashed link 36, real time detection of received URL's may take place in the receiver 10 to allow a time stamp to be stored with each URL in the buffer 34 to indicate its original time of arrival.

Referring additionally now to the flowchart of Figure 2, the process for co-ordinating the reception and handling of video signals with accompanying web links and the obtaining and display of ancillary data from the remote web sites commences at 50 with the identification and capture by receiver 10 of a URL accompanying a video broadcast currently being watched by a user on television display screen 18.

The capture of the web link is indicated to the user at 52, suitably through the appearance of a small icon overlaid on the current video broadcast on screen, which icon is selectable by the user through use of the UID 22. Other forms of notification, such as an audio cue, may be used instead or in addition.

At step 54, the system watches for user input to determine whether the user wishes to visit the web site identified by the captured link. A waiting loop provided by time-out test 56 determines when the system has waited without user input for a predetermined time and, following removal of the on-screen indication (or suppression of the audio cue) at 58, the procedure reverts to step 50 awaiting capture of the next URL.

If step 54 detects user input selecting the browse option, the browser 26 is instructed to access the identified site at step 60. Following this, a check is made at 62 as to whether or not the user is currently recording the video broadcast which carried the web links and, if not, at 64 the recording and playback stage 16 is triggered to start recording. Note that the stage 16 is assumed to be a video recorder with capability for simultaneous but independent playback and recording of audio and video data, such as to permit timeshifting of the received broadcast whilst the user browses the site identified by the captured web link. Having ensured, at 62 and 64, that the video broadcast is being recorded, the system effectively pauses playback of the broadcast at 66 - without requiring direct user instruction to do so before switching the display over to the browser.

User command and control of the functions of the browser 26 may suitably be via menu-driven selection presented via the display. At 68, a check is made as to whether the user has finished browsing by looking for a specific command from the UID 22, or the selection of a specific menu option from the on-screen display. In the absence of such a command, the process enters a wait loop at 70 from which it exits at step 68 when either the specific command is received, or a predetermined period has expired without user

input of any kind. Having exited the browser, a check is made at 72 (suitably through display of an on-screen message requiring specific response from the user) whether the user wishes to restart playback of the captured broadcast video. In the absence of user input. the system enters a waiting loop at 74 and remains there until either the input is received, or the available storage for capture of the video broadcast is filled.

Having been instructed to resume playback, the process reverts to 50 awaiting the next URL. With at least some of the subsequent portion of the broadcast having already been recorded, the next URL may already be captured. To handle this, various strategies may be implemented for book marking the recorded stream to indicate that a captured URL exists in memory 34 or for not separating the URL from the stream until played back by stage 16. Whatever the strategy, the process of Figure 2 continues largely as before, although the test at step 62 as to whether the video broadcast is being taped is modified to a test for whether the video broadcast has been taped which, in the affirmative, bypasses the "start recording" instruction of step 64 and proceeds to again stop the playback if browsing has been selected.

By way of a variant to the process of Figure 2, the triggering of timeshifting may be an automatic feature triggered internally by the browser on capture of a URL. In such circumstances, process steps 62, 64, 66 move up the order to preceed or immediately follow the indicate step 52.

Figure 3 illustrates a number of possible variants to the system described above. As shown, the present invention is hosted by separate television receiver 80 and digital video recorder 82 devices interconnected via a homebus data and control network 84. Also shown connected are a camera 86 for a security system, a simple audio recording and playback stage 88 and a telephone 90. Whilst the bus traffic resulting from the implementation of the shared CPU functionality may be carried with the received AV over the bus, the large volume of the latter lead to the preferred arrangement shown with a

separate and dedicated interconnection 92 between the television and video recorder.

Whilst the additional functionality supported by the timeshifting television and video combination may comprise Internet connectivity as before, with the external interface 30 to the web 32 being coupled to the bus 84 (thereby allowing support for an e-mail system and other Internet-capable devices on the bus), the trigger for automatically starting the capture of broadcast video and audio may instead (or additionally) be linked to the telephone such that, either when ringing or when the receiver is picked up (for both incoming and outgoing messages), the timeshifting is triggered. Triggering through the switching on or activation of other devices connected to the bus 84 (with those devices configured to send a signal via the bus to indicate to the recorder stage at least that their additional functionality has been triggered) may suitably also be supported. Lastly, whilst shown in Figures 1 and 3 as hard-wired connections to provide data and/or address and/or control buses, it will be recognised that some or all of the connections may comprise wireless (AM or FM radio or infra-red) link, for example telephone 90 in Figure 3 may be a mobile telephone.

From reading the present disclosure, other variations will be apparent to persons skilled in the art. Such variations may involve other features which are already known in the field of apparatuses for recording and/or replaying of audio and/or video signals and component parts thereof and which may be used instead of or in addition to features already described herein.

CLAIMS

1. Video recording and playback apparatus comprising a broadcast receiver arranged to receive broadcast video signals;

a display device coupled with said receiver and arranged to display the received video images;

a recorder and playback stage arranged to selectively record video signals received by said receiver and replay the same to said display device;

user operable input means by operation of which a user is enabled to control the functions of the display device and recorder and playback stage;

the apparatus further comprising function means supporting at least one further functionality and being arranged, on selection of said functionality during playback of received video images by said display device, to pause said playback whilst starting or continuing to record said received video images.

2. Apparatus as claimed in Claim 1, wherein said function means supporting at least one further functionality comprises a web browser with means for connection of the same to access data via the Internet and coupled to display data on said display device.

3. Apparatus as claimed in Claim 2, wherein the web browser is further operable to detect web links accompanying a received broadcast video signal and to provide an indication of such detection to a user.

4. Apparatus as claimed in Claim 3, wherein said web browser is configured to provide said indication by generation of an icon overlaying the display of received broadcast video on said display device.

5. Apparatus as claimed in Claim 1, wherein said function means supporting at least one further functionality comprises a domestic audio or video product coupled to the apparatus and configured to generate and send to the apparatus a signal indicative of selection of said functionality.

6. Apparatus as claimed in Claim 5, wherein said domestic audio or video product is coupled to the apparatus via wireless datalink.

7. Apparatus as claimed in Claim 1, wherein said selection of said functionality is triggered internally by said function means on determination that a predetermined condition or conjunction of conditions has occurred.

8. Apparatus as claimed in Claim 1, wherein said selection of said functionality is achieved through user operation of said input means.

9. Apparatus as claimed in Claim 1, wherein said function means supporting at least one further functionality comprises a telephone receiver coupled to the apparatus and configured to generate and send to the apparatus a signal indicative of selection of said functionality.

10. Apparatus as claimed in Claim 9, wherein said telephone receiver is arranged to generate said signal when a user picks up a handset of the receiver.

11. Apparatus as claimed in Claim 9, wherein said telephone receiver is arranged to generate said signal on detection of a incoming call.

12. Apparatus as claimed in Claim 1, wherein said function means supporting at least one further functionality comprises an e-mail system

coupled to the apparatus and configured to generate and send to the apparatus a signal indicative of said functionality.

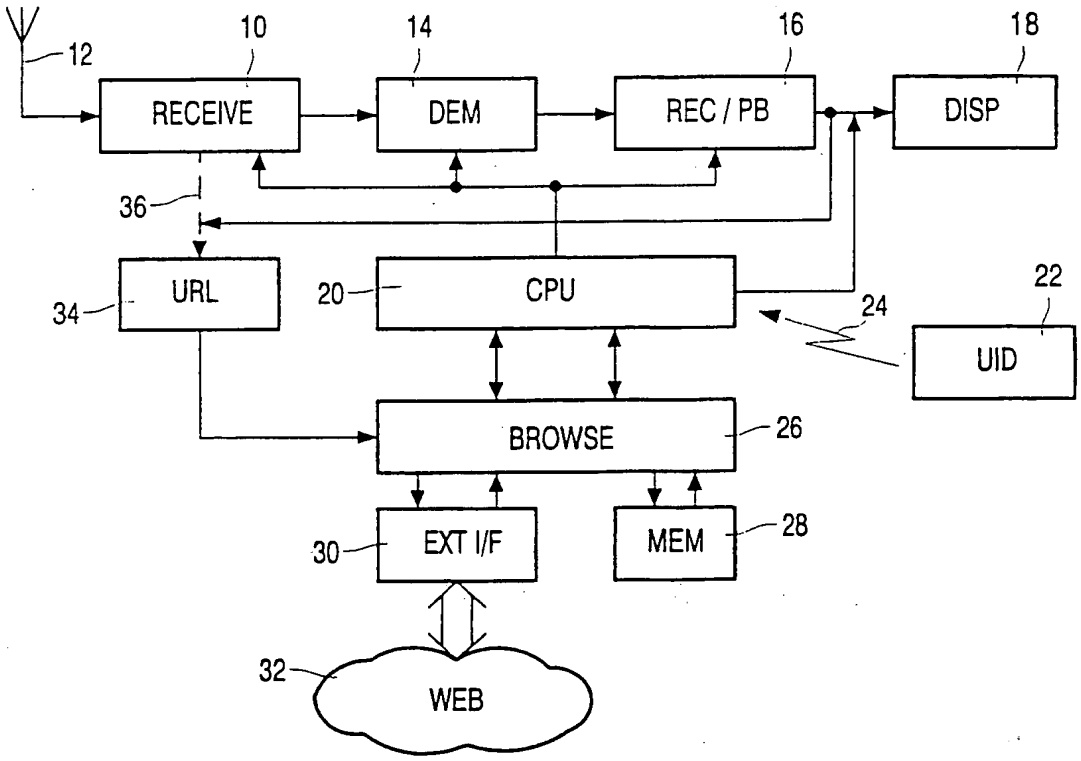

FIG. 1

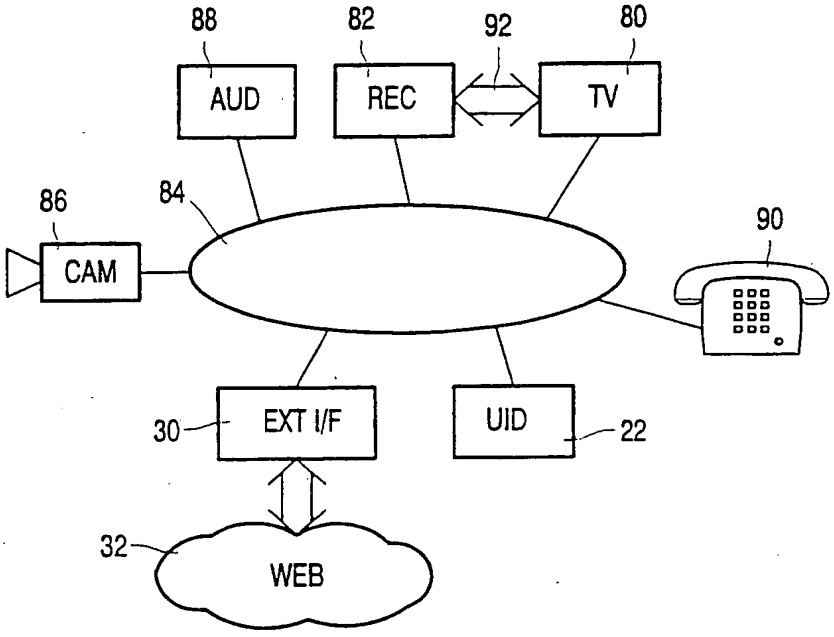

FIG. 3

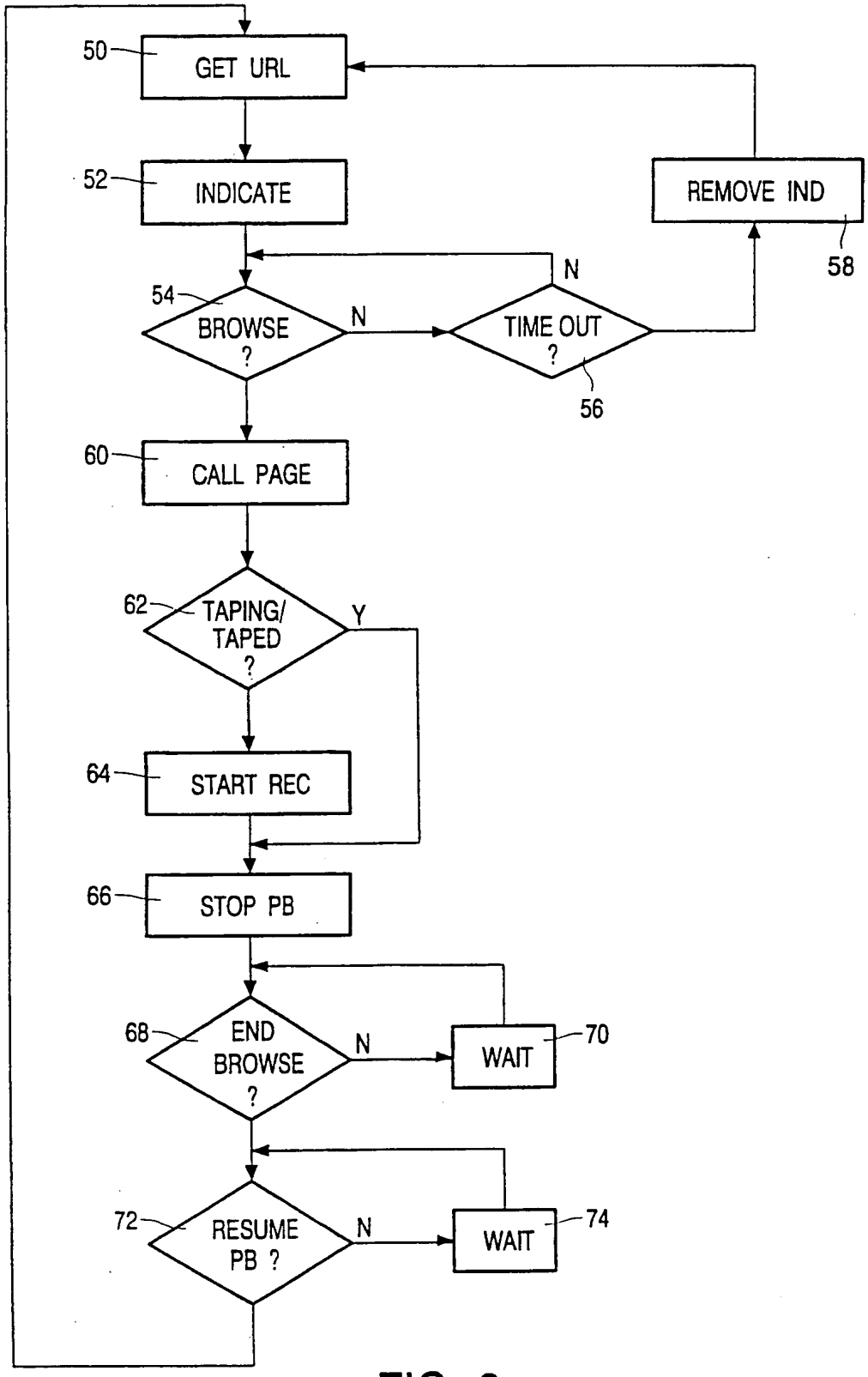

FIG. 2

INTERNATIONAL SEARCH REPORT

Inte ional Application No
PC.I /EP 00/09930

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H04N5/76

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H04N

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 98 48566 A (GEMSTAR DEVELOPMENT CORPORATION) 29 October 1998 (1998-10-29) the whole document	1-4,7,8
A		12
X	US 5 706 388 A (ISAKA) 6 January 1998 (1998-01-06) column 2, line 29 -column 4, line 11; figure 1	1,5-11
A		12

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

° Special categories of cited documents :

'A' document defining the general state of the art which is not considered to be of particular relevance

'E' earlier document but published on or after the international filing date

'L' document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

'O' document referring to an oral disclosure, use, exhibition or other means

'P' document published prior to the international filing date but later than the priority date claimed

'T' later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

'X' document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

'Y' document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

'&' document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
23 March 2001	03. 04. 2001

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Verleye, J

Form PCT/ISA/210 (second sheet) (July 1992)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/EP 00/09930

Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claims Nos.:
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. [X] As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

[X] No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. Claims: 1-4,7,8

   Video recording and playback apparatus for use in time-shifted reproduction of received broadcast video signals. The operation of the apparatus is controlled by means of a web-browsing appliance.

2. Claims: 5,6

   Video recording and playback apparatus for use in time-shifted reproduction of received broadcast video signals. The operation of the apparatus is controlled by means of signals coming from domestic audio or video appliances.

3. Claims: 9-11

   Video recording and playback apparatus for use in time-shifted reproduction of received broadcast video signals. The operation of the apparatus is controlled by means of signals coming from a telephone receiver.

4. Claim : 12

   Video recording and playback apparatus for use in time-shifted reproduction of received broadcast video signals. The operation of the apparatus is controlled by means of an e-mail system.

INTERNATIONAL SEARCH REPORT

information on patent family members

Intr tional Application No
PCT/EP 00/09930

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9848566 A	29-10-1998	AU 7684198 A	13-11-1998
		EP 0978198 A	09-02-2000
		JP 2001501068 T	23-01-2001
US 5706388 A	06-01-1998	JP 7130150 A	19-05-1995